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QUARTERLY PROGRESS REPORT
2nd Quarter 1949
(April, May, June)

FOREST UTILIZATION SERVICE

CENTRAL STATES FOREST EXPERIMENT STATION
COLUMBUS, OHIO

H. L. MITCHELL, DIRECTOR

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TIMBER HARVESTING AND SAWMILLING

Logging and sawmilling equipment demonstrations. - A two-day logging and sawmilling equipment show is shaping up for October 25 and 26 at the Ohio Agricultural Experiment Station at Wooster, Ohio. Extension Forester F. W. Dean is sponsoring the demonstration with a number of federal, state and private forest and conservation agencies cooperating. The FUS unit will have the responsibility of getting suitable equipment for demonstration. Emphasis will be placed on light inexpensive equipment suitable for farm woods operations. Some heavy equipment will be displayed, but not demonstrated. Logging equipment will be high lighted the first day and sawmilling the second. From two to three thousand farmers and sawmill operators from Ohio, western Pennsylvania, northern West Virginia, and northeastern Kentucky are expected.

On May 26 and 27 the Region Nine Equipment Development Committee sponsored a very interesting demonstration of the possibilities of the four-wheel-drive Jeep with allied equipment in the control and suppression of forest fires. The state of Missouri has a fleet of 40 to 50 Jeeps in their fire control program for over two years and has found them highly successful under Missouri conditions. As a result, the Regional Development Committee invited the Willys-Overland Company to put on a complete demonstration of its equipment under actual forest conditions to determine the potentialities of such equipment under varied conditions.

The demonstration clearly indicated that this light equipment had a definite place in the fire control program although some modification of both the Jeep power ratios and the design of allied equipment (plows, fire pumps, etc.) appeared desirable. Eugene Fobes of the FPL and Ralph Day of the Central States FUS attended the demonstration particularly to observe the possibilities of the Jeep and its allied lines for light logging operations especially in farm woods.

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Day was sufficiently impressed with its possibilities that he proposes to give the Jeep a prominent part in the Wooster logging and sawmilling demonstration this fall. The Jeep with Monroe hydraulic lift compares very favorably with the little Oliver Cletrac HG with hydraulic lift bar. It should be quite effective with such attachments as the Koenig winch and Carco junior sulky.

Day attended a very interesting logging and forestry demonstration sponsored by Mr. Howard Bennett, Forester for the Appalachian Hardwood Manufacturers, Incorporated, at Sharples, West Virginia on May 19. These one-day meetings, held four or five times a year, combine practical forestry demonstrations such as thinnings and release cutting plots with a few well selected demonstrations of new industrial equipment. At this demonstration the high light was a practical demonstration of profitable release of young yellow poplar under a canopy of decadent beech. Prof. Torkle Holsoe of the University of West Virginia dramatically pointed out the remarkable growth of yellow poplar on similar release plots, this was followed by a demonstration of profitable conversion of the overmature and hollow beech overstory into mine timbers by a highly portable bolter saw. In an unprepared timed period this little bolter saw split 6-foot hollow beech bolts up to 36 inches in diameter into 6-inch mine props at the rate of nearly 1½ per minute. This bolter saw with power unit mounted on a trailer sells for less than $1500. It is manufactured by the Howard Saw & Machine Company of Nashville, Tennessee.

Portable chippers. - The Asplundh Tree Expert Company has developed a small portable brush hog for disposal of brush and prunings, in connection with their extensive power line rights-of-way maintenance program. Day and Fobes of the FPL attended a demonstration of this equipment at Chicago early in June and were favorably impressed by its performance on limbs up to about 6-inches in diameter. With some modification of the throat and knives it should produce an acceptable pulping chip. Three models are currently in production, one a light trailer unit, the second a self-contained unit with special storage bin mounted on a 1½ ton truck chassis, and the third a tractor-mounted unit.

Tractor logging study. - A preliminary working plan for this proposed cooperative study was prepared by Day and R. D. Lane, in Charge of the Carbondale Branch of this Station. It has been submitted to International Harvester and Pacific Car and Foundry Company for review. The plan proposes a series of comparative studies between crawler and wheeled tractors with various types of allied equipment such as winches, arches, hydraulic lifts, skidding pans, etc. The purpose is to determine the extent to which the less expensive farm and industrial type wheeled tractors with allied equipment might be substituted for the crawler tractor in harvesting second-growth timber from farm woods. There are probably eight to ten thousand small sawmill operators in the Central States who cannot afford to tie up capital in expensive crawler tractors for seasonal or intermittent logging operations, but who have or could purchase wheeled tractors with suitable attachments capable of handling most second-growth farm timber.

Muskingum Watershed Conservancy District. - FUS has been cooperating with the Forester of this organization for some time with respect to their logging, sawmilling and utilization problems. In April, both Day and Brundage answered a hurry-up call to appear before a meeting of the District's Board of Directors to answer Board members' questions concerning a request from the Forester for some new harvesting equipment and auxiliary sawmill equipment for rough remanufacture. Economical removal and utilization of trees which should be thinned out for stand improvement, and production of pallet stock and a few other rough remanufactured products to enhance the income from milling operations were the objectives of the Forester's request for additional facilities. The Board also asked questions about forestry practices. The FUS statements must have hit the spot because word was received from the Forester later that his request was approved.

WASTE UTILIZATION

Through FUS contacts a specialty manufacturer in eastern Ohio was aided in disposing at a small profit his considerable volume of excelsior-like waste to a mattress manufacturer in Akron. Also, a manufacturer in Columbus of a new type wooden brake for motorcycles was supplied with a source of waterproof plywood discs, a byproduct of a manufacturer in southern Michigan.

SEASONING

Warpage of silverware chests. - Follow-up calls were made at a factory in northwest Ohio to find out how they were faring after taking action on advice given by FUS, the Laboratory, and the Southern Station FUS concerning warping troubles in small silverware chests made of tupelo gum from a Louisiana mill. As noted in our first-quarter report, the company had changed back to redgum obtained from another southern source while the tupelo gum supplier was attempting to revamp his dry kilns and kiln-drying procedure. The manager told Brundage that a new sample consignment of presumably properly kiln-dried tupelo had been received for trial, but its use had resulted in the same lid-warping troubles as previously. Whether this new sample was actually properly kiln-dried and stress-free at the time of edge gluing was apparently not substantiated by any adequate record of moisture content samples and stress tests. About the only inference that can be drawn, if a good kiln-drying job is assumed without supporting evidence, is that tupelo, as suggested by the Laboratory, is not the proper wood for thin, resawed, edge-glued, unveneered panels in these lightly constructed silverware chests. The lids particularly are easily warped by stresses arising from subsequent MC changes in top panels containing distorted grain or other variables subject to uneven shrinkage or swelling. Occurrence of warping when redgum has been used in the same construction has been negligible.

Wood bending troubles. - A call at a chair factory near Cleveland disclosed that the management was undecided about entering into a proposed cooperative agreement with the Laboratory for an examination of their bending operations to determine the causes of, and remedies for an increasing proportion

of bent-part rejects. Following an inspection in the factory and discussion with the company president, agreement forms were signed and mailed to Madison. Mr. E. C. Peck was assigned to the job by the Laboratory. Brundage joined him for a two-day survey of the company's bending equipment and the practices followed before, during and after the bending operations. It was found that variations in moisture content of stock and steaming practices were the causes of some degrade and rejections, but the main factor was inadequate end-pressure resulting from the use of faulty and worn-out equipment. Rejects from tension failures in thick office-backs and bevels requiring severe bends sometimes had gone as high as 40 percent. Incidentally, it was observed that unnecessary losses of high-grade hardwood lumber were occurring in the air yard from poor piling practices. Follow-up will be made next quarter to check on the application of suggested remedies in Mr. Peck's report to the company and the results of the changes made.

Moisture-content control in furniture production. - The Keller Mfg. Co. at Coryden, Indiana makes solid oak furniture exclusively. Following some correspondence with the Laboratory concerning seasoning practices, Mr. Rietz, Chief of Timber Physics, believed this plant would be a good place for a detailed moisture-content control study. Results would be applicable in general to solid wood furniture fabrication and in particular to solid oak construction involving large, unveneered, edge-glued table tops. Observations at the factory by Brundage showed a well-organized operation with modern dry kilns and an excellent air-drying yard filled with lift-truck units stacked ready for the kilns. However, flaws come to light in discussing their kiln-drying practices with the kiln operator which indicated the probability of too-wide deviation in the final MC of lumber going into production. Further evidence of this was seen when some table tops were examined which had been sent back by a wholesaler after they had developed shrinkage or swelling defects in his warehouse. The manager is interested in carrying on the kind of intensive sampling desired by Mr. Rietz for investigations of practical moisture-control procedures on a commercial scale. Some preliminary sampling is contemplated, which we hope will be followed by company cooperation in an intensive study project to start late this fall.

GLUING

Preliminaries started for another gluing clinic. - A second gluing clinic in the Central States was proposed at the 1949 Madison program conference to be held possibly in Chicago or southern Indiana. A call on June 10 by Brundage at the Murphy Chair Company factory in Owensboro, Kentucky suddenly started the wheels turning for a clinic in that city which lies just across the Ohio River from southern Indiana. The manager of the factory had heard about the previous gluing clinics at Louisville, Kentucky and Drexel, North Carolina and wanted one in his area. He offered his own services as an organizer and was sure he could get the Owensboro Chamber of Commerce to act as sponsor. Owensboro happens to be rather centrally located with respect to a group of furniture factories within a radius of about 25 to 50 miles. Preliminary contacts in the area indicated that a

clinic in Owensboro could very likely enroll the maximum of 30 men from factories in Livermore, Kentucky 22 miles south, Tell City, Indiana 30 miles east, Henderson, Kentucky and Evansville, Indiana 30 to 38 miles west, Huntingburg, Jasper and other Indiana towns 45 to 52 miles north, and Owensboro itself. The Laboratory agreed to assign gluing specialists to conduct the clinic sometime between mid-September and mid-October.

DERIVED PRODUCTS

Wood molasses. - Brundage made several contacts during the quarter with persons interested in wood molasses for stock feeding tests or for yeast production. These included: Ohio Agricultural Experiment Station at Wooster. Dr. Pratt, Dairy Industry Department, is planning a feeding test of wood molasses mixed with grass silage to start in May 1950.... Kentucky Agricultural Experiment Station, Lexington. Conferred with Dairy Husbandry staff men in company with Dr. Paul E. Johnson of TVA. They will seek approval to conduct three studies - (1) wood molasses as a grass-legume silage preservative; (2) long-time effects of feeding a wood-molasses supplement to dairy cows; (3) double-reversal feeding test with dairy cattle to study effect on milk production....Department of Bacteriology, University of Kentucky, Lexington. Called on Prof. Mary M. Hardin. Has a graduate student, Mr. Shoukat Husain, who conducted research on fat yield of various yeasts. Best one found was Rhodotorula gracilis with 50 percent fat extractable in ether. Some yeast strains and a small amount of wood molasses were supplied by the FPL....Quaker Oats Company, Chicago. Dr. O. B. Kent has been unable yet to start pellet-feeding tests with wood molasses furnished last year by the FPL. He expressed a desire for intensive wood-molasses rumen studies by the Ohio Agricultural Experiment Station under the Direction of a staff member there who is recognized by commercial feed producers as an expert in that line of research....Arcady Farms Milling Company, Chicago. Dr. Fred Rech asked for a few gallons of wood molasses when available, for feeding tests under his direction....Swift and Company, Chicago. Mr. R. E. Gray would like 50 pounds of wood molasses when available to make mineral block (5 percent w.m.) for trial at the company feeding research center....Moorman Mfg. Company, Quincy, Illinois. Dr. W. P. Elmslie has already tested wood molasses as a salt-cake ingredient with good results. Would like 50 gallons more to use with soy bean meal concentrates for testing palatability and dust controlling efficacy. Dr. Elmslie also would like to see more rumen studies made by Agricultural Experiment Stations....Illinois Mfg. Company, Quincy. Dr. Heidbreder asked for 1 to 5 gallons of wood molasses both for experiments in propagating yeast and mixing with mineral cakes. This company is installing new equipment to increase output to 1000 pounds of feeding yeast per 24-hour day....Calcium Carbonate Company, Quincy. Dr. A. J. Gehrt wishes to try a small amount of wood molasses for dust control with salt and bone-meal mixtures. The company tried blackstrap for this purpose about 1½ years ago without success....Ralston Purina Company, St. Louis, Missouri. Dr. J. H. Burrell is conducting feeding experiments with wood-

sugar yeast furnished by the Laboratory but will have no results until the tests are completed some months from now. He thinks wood molasses may have detrimental effects when fed over long periods to the same animals even though no harm may be apparent from a few months' or a year's feeding. He cited beet tops as an example of this kind which he said had killed thousands of animals to which this farm byproduct was fed more than one season, probably because of the oxalic acid content.

TVA wood-molasses conference. - A conference at the Muscle Shoals plant of TVA near Florence, Alabama was held in May. The purpose was to discuss the plans for operating the new wood-molasses pilot plant being installed there, and the disposition of the molasses they expect to make during the F.Y. 1950. Attendance, aside from several TVA representatives, included Dr. Harris of the Forest Products Laboratory, Dr. Hanns G. Maister of the Northern Regional Research Laboratory at Peoria, Illinois and one FUS representative from each of the Forest Experiment Stations whose territory embraces land under TVA administration, i.e., the SE, Southern and CS Stations. Brundage attended for Central States FUS. Production of wood molasses for feeding tests from the TVA plant will be limited to between 8,000 and 10,000 gallons during F.Y. 1950. Twenty-five percent of this will be allocated by the FPL for feeding tests, according to the cooperative agreement, in conjunction with the molasses and yeast to be made at the Madison pilot plant. The other 75 percent will go to Experiment Stations within TVA territory. In the Central States, Agricultural Experiment Stations in Ohio and Kentucky have been allotted 200 and 400 gallons, respectively. The TVA pilot plant has about $2\frac{1}{2}$ times the hydrolyzer capacity of the Madison Laboratory plant. TVA will include economic studies of the production, distribution, and feeding of wood molasses.

SPECIAL PURPOSE WOOD

Bending oak. - As a part of a study to determine the particular tree-growth, site and other characteristics which may be recognizable ear marks of high-quality bending oak, Dr. Maxon Pillow of the Laboratory spent three days in May on the operations of the Robinson Lumber Company in western Ohio. The Robinson Company, with a mill at Schumm, is recognized as a consistent producer of good white oak timbers for bending.

Violin spruce. - Some time ago the Northern Rocky Mountain Forest Experiment Station exchanged correspondence with an expert violin maker in Parma, Ohio concerning characteristics of the type of spruce wood considered best for fine violins. When Brundage visited the violin shop in May of this year, he was shown spruce flitches obtained from Switzerland, selected especially for violin making, and some Engelmann spruce flitches from the NRM area. The Swiss spruce is preferred principally because occasional pieces have extra-distinct, fine lines of summer wood which give the finished appearance said to be a highly prized characteristic of old-time violin makers' masterpieces. Extra toughness is another desirable feature since the tougher flitches may be shaved thinner to improve tonal quality without unduly weakening the finished instrument. The Northern Rocky Mountain Station stated effort would

be made to find some Engelmann spruce more nearly approaching the character of the Swiss spruce than that previously sent to the Ohio violin maker.

FUELWOOD

Kentucky fire-cured tobacco. - A few inquiries about the use of wood by the dark-fired tobacco industry in Kentucky were made by Brundage in response to a memo from the Forest Products Laboratory regarding a proposed cooperative study under the Research and Marketing program. Low-grade wood, bark and sawdust are now burned by the dark-fired tobacco producers directly on the dirt floors of curing barns in a manner which will produce dense smoke and a moderate temperature of 100° to 110°F. The smoke gives the desired odor and flavor which characterize this type of tobacco. A rough estimate of the wood used for such curing in 1948 is 230,000 cords. Prof. E. J. Kinney, University of Kentucky, said the production of dark-fired tobacco has been declining rapidly from 200 million pounds in 1917 to 70 million pounds in 1948. The 1948 acreage was about 68,000. By contrast, 453,000 acres were planted with varieties of tobacco which are air-cured. The air-cured tobaccos are more profitable to the growers, according to Prof. Kinney. When humidities rise to a point favorable for the growth of mold and rot on tobacco hung in barns for air-curing, coke-fired stoves are used until the danger subsides. Wood has apparently never been utilized to control humidity by producers of air-cured tobacco. The study of wood fuel useage by the dark-fired tobacco industry will be directed toward the possibilities of attaining greater economy and lowering the fire hazard with wood burners designed to produce the required smudge and moderate curing temperature. The study will cover fire-cured tobacco districts in Tennessee and Virginia, as well as in Kentucky, so three different Station territories are involved - SE, Southern and CS. Since somewhat similar cooperative studies have already been made in SE territory, the SE Station has been designated to carry on Forest Service liaison with the Research and Marketing Administration.

FIELD CONTACTS, MISCELLANEOUS

Following are some miscellaneous field contacts made by Brundage during the quarter, not covered under preceding captions. Special subjects or problems discussed are noted briefly. Technical information was provided by FUS, the Forest Products Laboratory, or both....Joseph Oker & Sons Company, Kentucky. White oak cooperage manufacturers. Moving plant to new location shortly and plan to build new dry kilns. Information requested on dry kilns, kiln drying schedules, and conditioning; also on barking machines....Hoge Lumber Company, Ohio. Nailing of prefab, curved barn rafters and high-frequency gluing of small blocks salvaged from rips and trims....State Forester's Office, Ohio. Discussed with the author, Mr. James Meteer, various angles of Ohio wood-waste survey he is organizing in manuscript form for publication....Brunswick-Balke-Collender Company, Chicago. Handling of hard maple

for bowling pins and seasoning of rough blocks. This company, which manufactures the major output of bowling pins in the U. S., is opposed to laminated pins. Claims to have encountered no trouble yet in obtaining all the maple needed for solid pins....Cemex Corporation, Illinois. Manufacture aspen-excelsior and Portland cement building panels in thicknesses of 1, 2, 3 and 4 inches, at present by hand methods. Apparently this board has exceptionally good water resistance. Aspen-excelsior was found superior for this product in comparison with other species tested. Special treatment of the excelsior with a chemical solution which gives 100 percent bond with the cement is said to be the secret of the panels' water resistance. Main problem now is raising $200,000 for mechanizing production.... Jefferson Wood Working Company, Kentucky. After trying several species for barrel bungs, have returned to yellow poplar as the only satisfactory species. Increasing use of metal barrels for liquids has reduced wooden barrels and bung business to a very small fraction of former volume....Howard B. Rich, Inc., Kentucky. Ladders and ironing boards principally. Furnished information on seasoning. Have designed a new folding-leg wooden ironing board to compete with cheap metal boards which have been underselling old-style wooden boards....Prof. Davenport, University of Kentucky. Forestry instructor. Discussed FUS work in Kentucky....State Forester, Kentucky. Discussed all lines of Laboratory and FUS work of interest to his organization. Furnished Laboratory reports on wood-molasses subjects. ...Girdler Corporation, Kentucky. Discussed H F gluing and Thermex generators....Du Crafts, Inc., Indiana. Occasional tables. Discussed use of beech and yellow poplar, thin plywood for table tops, seasoning and gluing. Furnished information on seasoning of beech and gluing....Jasper Wood Products Company, Indiana. Office furniture. Discussed gluing and company's attitude relative to conducting a gluing clinic in that general vicinity. Attitude was favorable....Firestone Tire and Rubber Company, Ohio. Had written to FPL regarding breakage of hickory spud-bar points. (Spud-bars with wedged-shaped wood points are used in foundries to avoid damage in handling heavy castings.) Acting on FPL advice, point had been redesigned for greater strength, but new points had not yet been tested in service. The FPL had furnished articles on selection of tough hickory.....Brown & Brown, Inc., Ohio. Make tide gates for Army flood-control installations. Problem is to avoid shrinkage and splitting after pressure-creosoted timbers (6 x 8 inches and 8 x 8 inches) are framed and assembled in gates. Cannot depend on getting proper drying of dense structural grade timbers before creosoting at the treating plant....Anderson Wood Products, Ohio. A small cabinet shop. Wanted advice on expanding production....Ohio Boxboard Company, Ohio plant. Inquired whether company is planning manufacture of pulp and corrugating paper from local hardwoods as reported to FPL by a company man two years ago. Was informed they are doing this only at their South Carolina mill. Ohio plant will continue to make only liners from waste paper and southern kraft pulp, in addition to their manufacture of finished paper boxes here....Koppers Company, Wood Preservation Division, Ohio. Requested information regarding effect on high temperatures on strength of wood, and toughness testing procedures....Schneider Lumber Company, Ohio. Has a small dry kiln under construction built entirely on basis of information provided by the FPL. Building is all wood with sawdust insulation.

CONFERENCES, MEETINGS AND MISCELLANEOUS

3-Station FUS Coordinating-Committee Conference. - The purpose of this conference was to discuss and coordinate FUS activities in Region 7, which has Virginia in SE, and Kentucky in CS Station territory in addition to its major area in the territory covered by the NE Station FUS unit. The conference was held in early April at the NE Station, Upper Darby, Pennsylvania. It was attended by representatives of S & PF (R-7), the Forest Products Laboratory, NE Station FUS and Division of Economics, SE Station FUS and CS Station FUS. Brundage represented the CS Station FUS unit. A mimeographed report of the proceedings was prepared by the NE Station.

Annual CS Station Program Conference, Columbus, Ohio. April 18-22, and Annual FPL-FUS Program Conference, Madison, Wisconsin. May 9-12. Day and Brundage attended both of these conferences. A copy of the FUS program for the F.Y. 1950 is enclosed with this 2nd Quarter Progress Report for each office which has not received one through other channels.

Forest Products Research Society Annual Meeting held at Grand Rapids, Michigan, May 23 and 24, was attended by Day.

Recent Developments in Wood Utilization was the subject of a talk given on June 1 by Brundage, at the invitation of Dr. O. D. Diller, to the latter's forestry class at Ohio State University.

Distribution of this progress report

Chief, FS (2); FPL, Madison (8); Forest Experiment Stations in U. S. (1 ea.); Forest Supervisors (1 ea., Cumberland, Clark, Mark Twain, Shawnee, Hoosier, Wayne); R-9, Milwaukee (3); R-7, Philadelphia (2); 4 CS Branch Stations (1 ea.).